Mackworth-Praed, C. W. & Grant, C. H. B. 1962. *Birds of the Southern Third of Africa.* London: Longmans Green.
Marler, C. 1973. Breeding of the Black Spur-winged Goose and the Black Brant at Flamingo Gardens, Olney. *Int. Zoo. Year Book* 13.
McLachlan, G. R. & Liversidge, R. 1970. *Robert's Birds of South Africa.* Cape Town: Central News Agency Ltd.
Pitman, C. R. S. 1963. The nesting and some other habits of *Alopochen, Nettapus, Plectropterus* and *Sarkidiornis.* Wildfowl Trust, 16th Annual Report.
Prozesky, O. P. M. 1970. *A Field Guide to the Birds of Southern Africa.* London: Collins.
Scott, P. 1961. *A Key to the Wildfowl of the World.* London: Country Life.
Smithers, R. H. N. & Mackenzie, M. J. S. 1973. *Guide to the Waterfowl of Rhodesia.* Trustees: National Museum and Monuments of Rhodesia.
Stark, A. C. & Sclater, W. L. 1906. *The Fauna of South Africa. Birds,* 4. London: Porter.
Woolfenden, G. E. 1961. Post cranial osteology of the Waterfowl. *Bull. Florida State Mus. Biol. Sci.* 6(1): 1–129.

Address: A Clark, 32 Southy Road, Farrarmere, Benoni 1500, Transvaal, South Africa.

The *Bradypterus cinnamomeus-mariae* complex in Central Africa

by R. J. Dowsett & R. Stjernstedt

Received 5 February 1979

The status of *Bradypterus cinnamomeus ufipae*

Since Grant & Mackworth-Praed (1941) described *Bradypterus cinnamomeus ufipae* from Mbisi, Sumbawanga, on the Ufipa Plateau in southwestern Tanzania, all workers have attributed this form to the species *B. cinnamomeus.* Grant & Mackworth-Praed considered *ufipae* to be confined to the Ufipa Plateau; they record that the type (obtained by R. E. Moreau's collector) was from an altitude of 2440 m, although in fact Mbisi Forest is at about 2250 m. White (1960) considered *ufipae* to be a poorly differentiated form, best treated as synonymous with *B. c. nyassae.* Benson *et al.* (1971) ascribe to *B. cinnamomeus* a wide distribution in northern Zambia, in both montane and non-montane areas. They attribute all Zambian material to the race *nyassae,* but point out that birds from non-montane areas of the Northern and Luapula Provinces are rather redder, implying an approach to *ufipae.* Hall & Moreau (1970) draw attention to these Central African populations (Map 179), but consider them "duller and more olive" than populations of *B. cinnamomeus* from elsewhere.

During the past few years we have studied the morphology, vocalisations and distribution of various populations of *Bradypterus* in Central Africa. We are convinced that all workers have been in error in ascribing *ufipae* to *B. cinnamomeus,* as it is clearly a form of *B. mariae* (or *B. barratti, sensu lato*). The *Bradypterus* which occurs in the non-montane forests of northern Zambia, mostly between 1200 and 1600 m altitude, is the species *mariae* and not *cinnamomeus.*

White (1960) appears to have confused these two species in the hand, as did Grant & Mackworth-Praed (1941) and other workers; we suspect that when he considered *ufipae* to be close to *B. cinnamomeus nyassae,* he cannot have had specimens of *nyassae* for a direct comparison.

The songs of the two species have also been confused, for Benson (1956) considered the song-call of northern Zambian birds (which he and Moreau then attributed to *ufipae*) to be similar to that of *B. c. nyassae,* which Benson (1940) had in fact distinguished from the voice of *B. mariae* (as *B. usambarae*) in Malawi. Benson (*in litt.*) feels that this error may have been due to deterioration in his hearing, and by 1964 he could not hear the song of either species at all.

The morphology, voice and ecological distribution of these two *Bradypterus* species in Central Africa are discussed below. For the purpose of the present study we find it convenient to consider *B. mariae* and the Cameroun-East Congo *B. lopezi* species separate from *B. barratti* of southern Africa, of which we have no personal experience. Both White (1960) and Hall & Moreau (1970) treated all 3 forms as members of a single species, *B. barratti.* Benson (1946) felt that the voice of *barratti* in eastern Rhodesia was indistinguishable from that of *B. mariae usambarae* and *granti* of Malawi, but his description of *barratti's* voice differs in several respects from our own experience of that of *usambarae.* Moreover, Oatley (1969: 178) implies that *B. barratti* of Natal (in comparison to *B. cinnamomeus=mariae* of northwestern Zambia) does not duet. Clearly, anyone in a position to tape-record the voice of *barratti* should compare it sonographically with the songs of the *mariae* populations discussed in the present paper.

Morphological differences between *Bradypterus mariae* and *cinnamomeus*

In 1971, during a visit to the Ufipa Plateau, Dowsett was impressed by the morphological similarity of topotypical *ufipae* in Mbisi Forest to *B. mariae usambarae* of the montane forest interior of the Nyika Plateau. Both are distinct from *B. c. nyassae* of the Nyika in having the colour of the upperparts dark and saturated, and a relatively short tail with narrow rectrices. Dowsett found *ufipae* frequently on the edge of forest (a niche usually occupied by *B. cinnamomeus*) as well as inside, but this is not surprising as much of the canopy of Mbisi Forest is broken up by emergents such as *Euphorbia* sp., and the dark under-storey usually favoured by *mariae* is generally lacking. As far as we could determine, *ufipae* is the only form of *Bradypterus* at Mbisi. Elsewhere in southwestern Tanzania, Zambia and Malawi we have found two species sympatrically in several localities: *B. mariae* in the interior and *B. cinnamomeus* in bracken-briar on the edge of forest.

When Dowsett visited the Marungu highlands of southeastern Zaire in 1972 (Dowsett & Prigogine 1974) he found 2 forms of *Bradypterus*:— *ufipae* inside narrow riparian forest and *cinnamomeus* in bracken-briar on the forest edge. Specimens of both were collected, and these were compared to series gathered from the collections of the British Museum (Natural History), American Museum of Natural History, Livingstone Museum (Zambia), Musée Royal de l'Afrique Centrale (Tervuren) and National Museums of Rhodesia. The results of comparisons made independently by C. W. Benson, Mrs. R. T. Chapin and Dr. A. Prigogine are discussed by Dowsett & Prigogine (1974). These comparisons, which included the types of *ufipae* and *nyassae,* showed clearly that the Marungu specimens were of these 2 forms. Consequently, *ufipae* cannot be considered conspecific with *B. cinnamomeus,*

as they occur on Marungu within sight and sound of each other. We therefore concluded that *ufipae* is correctly placed in the species *mariae* or *barratti*.

In colour *B. cinnamomeus nyassae* differs consistently from the races of *B. mariae* in being paler on the upperparts, more reddish and less chocolate in tone. Below, *nyassae* is less richly coloured than *B. m. granti* of southern Malawi, the throat always white without any rufous wash, and the white on the belly better developed. By comparison, *nyassae* and *ufipae* are more similar below. The rectrices of *nyassae* are wider than those of *mariae,* the central pair when fresh being about 15 mm wide at one-third of their length from the apex, as against 10 mm.

It is clear from the measurements of these two *Bradypterus* species that there is no consistent size difference between the sexes, although the largest individuals are usually males. For this reason measurements of both sexes and of unsexed specimens are combined in Table 1. C. W. Benson and M. P. S. Irwin (*in litt.*) kindly supplied the wing and tail lengths, taken by them from museum specimens on our behalf. The weights were all taken by Dowsett from birds collected or caught for ringing.

TABLE 1

Weights and measurements of *Bradypterus cinnamomeus* and *B. mariae* in Central Africa

	Weights (g)	Wing (mm)	Tail (mm)	Tail/Wing
B. cinnamomeus nyassae	16.3–22.0	58–67	68–83	1.11–1.31
(Localities from Nguru Mts,	*mean:* 18.5	61.8	73.8	1.18
Tanzania, south to Mulanje Mt,	*n*=20	29	21	21
Malawi; Marungu, Zaire).				
B. mariae ufipae	17.0–24.0	62–72	63–74	0.97–1.11
(Ufipa, Tanzania; Marungu,	*mean:* 20.2	66.8	69.7	1.04
Zaire; northeast and northwest	*n*=17	34	28	28
Zambia).				
B. mariae granti & usambarae	12.0–19.9	59–67	55–67	0.90–1.06
(Mt Rungwe, Tanzania south to	*mean:* 16.9	62.0	62.1	1.00
Mulanje Mt, Malawi).	*n*=29	51	34	34

The ratio of tail to wing length is considered to be of specific importance, and the figures for *B. cinnamomeus nyassae,* which has a relatively long tail, barely overlap with those for the races of *B. mariae.*

B. m. ufipae is larger than the other races of this species studied here, in wing and tail measurements, and it even averages heavier than *B. c. nyassae.* However, *ufipae* does have the relatively short tail typical of *B. mariae,* although it shows some approach to *B. c. nyassae* in this character.

Our data, although admittedly limited, do not suggest any increase in size differences between *B. cinnamomeus* and *B. mariae* where they are sympatric geographically (e.g. Nyika, Rungwe and Marungu). As these two species are almost invariably segregated ecologically where they do occur together, there is unlikely to be any direct competition between them.

SPECIFIC DIFFERENCES IN VOCALISATIONS

Independently of studies of the morphological relationship of *ufipae,* important differences in the vocalisations of some Central African populations of *Bradypterus* were noticed by Stjernstedt. In particular, he noted that the voice of the supposed *B. cinnamomeus* in the non-montane forests of

northeastern Zambia was apparently identical to that of montane *B. mariae* of the southern highlands of Tanzania and of *ufipae* in the Mbisi Forest. These Zambian birds responded actively to playbacks of the recorded song of *mariae* from southwestern Tanzania.

B. c. nyassae of southwestern Tanzania has a song very different from that of *B. mariae,* with which it is locally sympatric, and tape recordings of *nyassae* produced no response from the birds tested in northeastern Zambia at Mbala. At first Stjernstedt thought that the song of *B. cinnamomeus* must diverge where the species occurs sympatrically with *B. mariae,* but this is

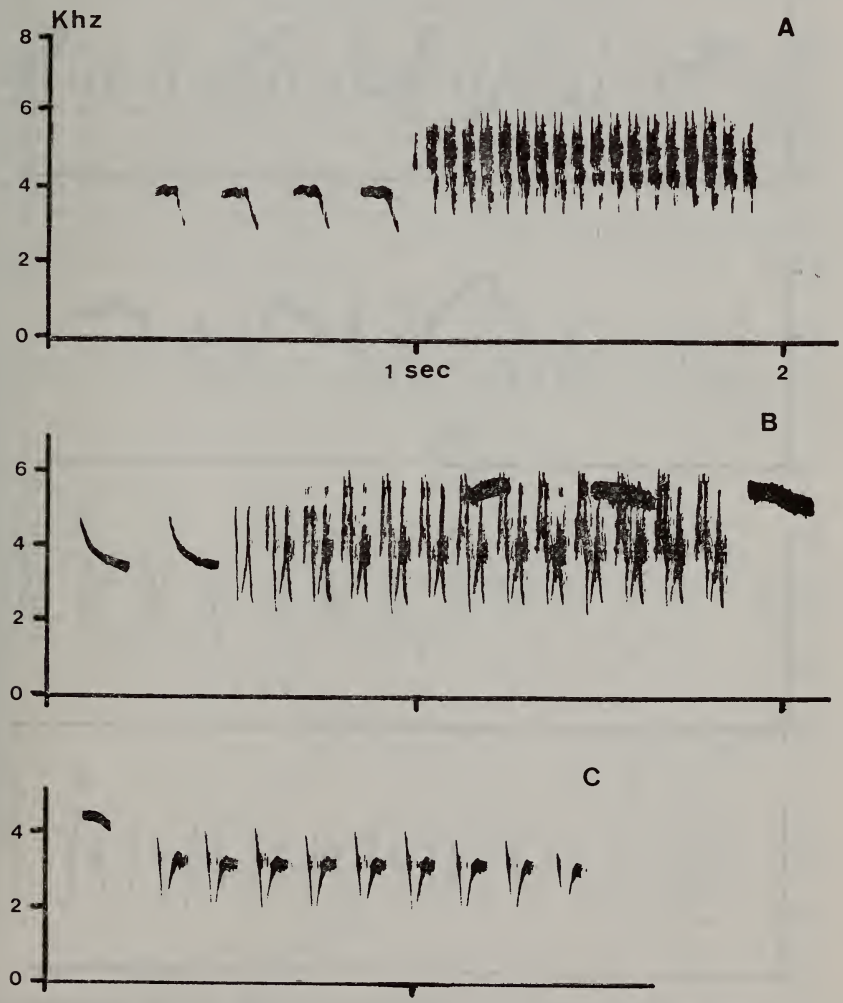

Fig. 1. Sonograms illustrating songs of: A, *Bradypterus cinnamomeus nyassae,* Mbeya (southwest Tanzania); B, *B. c. nyassae,* Ilembo (southwest Tanzania); C, *B. c. cinnamomeus,* Irangi Forest (Kenya). 1A, 1B from tapes by Stjernstedt, 1C from Keith (1971).

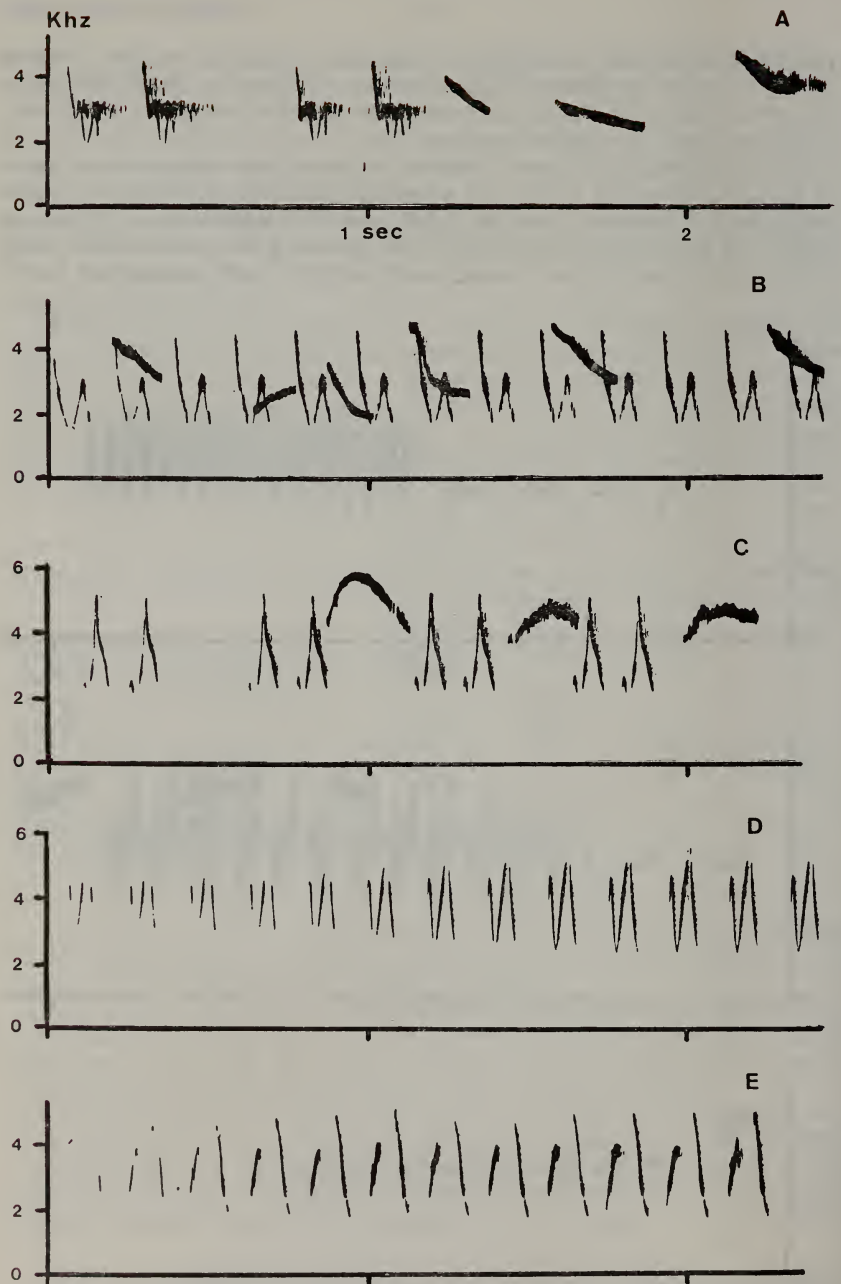

Fig. 2. Songrams illustrating songs of: A, *Bradypterus mariae ufipae,* Mbisi Forest (southwest Tanzania); B, *B. m. ufipae,* Mbala (northwest Zambia); C, *B. m. usambarae,* Tukuyu (Southwest Tanzania); D, *B. m. usambarae,* Ilembo (southwest Tanzania); E, *B. lopezi camerumensis,* Mt Cameroun. All from tapes by Stjernstedt.

clearly not the case, for in playback experiments the Mbala population did react to the song of *mariae*.

The song of *B. cinnamomeus* (Fig. 1) is typically a rattle of 10-20 beats per second, lasting about one second and preceded by 2-5 "seep – seep – seep" notes. A second bird sometimes accompanies in duet with three or four high pitched notes of even pitch.

The song of *B. mariae* (Fig. 2) differs from that of *B. cinnamomeus* in the following respects: no initial "seep" notes; delivery of notes varying in tempo from 2 to 6 beats per second, sometimes grouped in twos (e.g. Fig. 2A, 2C); notes are delivered crescendo; if a second bird accompanies in duet (Fig. 2A, 2B, 2C) it gives arhythmic phrases of variable pitch.

Fig. 1C shows a sample of the song of nominate *B. cinnamomeus* from Kenya (from Keith 1971). Here the tempo is rather slower, resembling the song of *B. mariae* in this respect, but there is no crescendo and it is preceded by the diagnostic "seep". Fig. 2E depicts the voice of *B. lopezi* from Mt Cameroun, considered by some authorities to be specifically distinct from *mariae* and *barratti*. We have not examined specimens of this form, but the song can be seen to be typical of *mariae*.

To sum up, the vocalisations of *B. mariae ufipae*, the other forms of *mariae* and of *B. cinnamomeus* suggest a similar picture to that presented by our studies of morphology and ecology.

The distribution of *B. cinnamomeus* and *B. mariae* in central Africa

Because Hall & Moreau (1970) followed White (1960) and others, their Maps 179 and 180 are mainly – though not entirely – incorrect as regards the

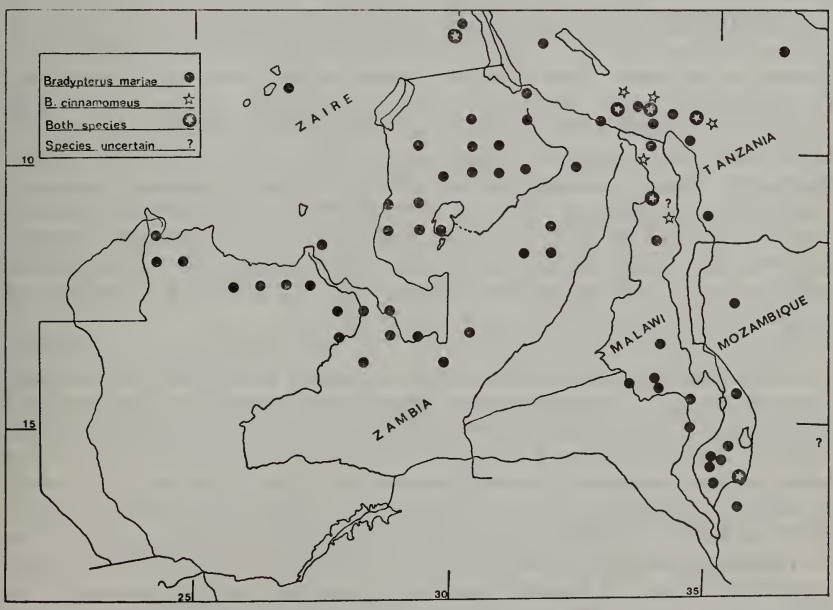

Fig. 3. The Central African distribution of *Bradypterus cinnamomeus* and *B. mariae*. Zambian records plotted by $\frac{1}{4}°$ square (from *An Atlas of the Birds of Zambia*, Dowsett in prep.).

Central African distribution of these two *Bradypterus* species. In Fig. 3 we show their correct distributions in this area, based on our field observations and the re-assessment of specimens described in this paper.

Doubt attaches to the identity of *Bradypterus* warblers noted at 2 localities (shown as ? in Fig. 3). Benson & Benson (1977) refer to *B. cinnamomeus* as "probable also on Uzumara" (a satelite mountain of the North Vipya, in sight of the Nyika), but Benson (*in litt.*) did not collect a specimen, nor can he trace any sound record. According to Chapman & White (1970: 132), Uzumara reaches only to 1920 m altitude. At Namuli in Mozambique, Vincent (1935: 511) saw and heard *Bradypterus* which he considered similar to those he collected on Mulanje. Both Vincent's specimens are in the British Museum at Tring, and are *B. mariae* (Benson *in litt.*). Although there is no specimen from Namuli, it is likely that *B. mariae* occurs there.

However, *B. cinnamomeus* does also occur on Mulanje, which is the type locality of the race *nyassae*. Benson has kindly re-examined the type specimen for us, and confirms that it is indeed a form of *cinnamomeus*. The status of this species on Mulanje is not clear, and White (1960: 408) remarked that it was known from there only by the type. Belcher (1925: 810) referred a C/2 collected on Mulanje to *cinnamomeus,* although his comparison of the voice of birds heard "in the wood" to that of the *Bradypterus* (*mariae*) of Zomba and Chiradzulu, suggests that he also encountered *mariae* there. The field observations of Penry & Talbot (1975) suggest they were not always confident of their identifications of *Bradypterus* on Mulanje, but they nevertheless seem to have found both species quite common, and Jackson (1971) obtained specimens of both.

Doubtful field observations from elsewhere in Malawi are mentioned by Benson & Benson (1977: 149-50, 255). Until records of *B. cinnamomeus* from Zomba and its outlier Malosa are supported by specimens, sound recordings or critical field notes, we would agree with Benson & Benson that they cannot be admitted. However, Garcia's observations of *Bradypterus* in both forest and bracken-briar do suggest *a priori* that 2 species may be present. Benson & Benson also mention the need for further investigation in south-western Ntcheu District. This is in reference to the observations of Benson (1942: 314), who reported *B. mariae* from Mvai Mt and between Tsangano Mt and the Ntcheu border, in bracken-briar. In this habitat *cinnamomeus* might seem more likely, although Benson (*op. cit.*) mentions a specimen of *mariae* from Dzonze Mt, some 25 km south of Mvai.

We have accepted the sound record of *B. cinnamomeus* from bracken-briar on Chimaliro, reported by Benson (*op. cit.*), even though we have stressed the care needed to separate the two species on voice alone. Chimaliro, like Uzumara, is a northern element of the North Vipya, and is isolated from the Nyika (where *cinnamomeus* is common) by lowlands. The mountain is 2060 m high and has extensive forest (Chapman & White 1970: 134), in which *B. mariae* is certainly also to be expected. Uzumara and Chimaliro are both poorly-known ornithologically. Benson & Benson (1977) refer to there being no record of *mariae* from Ntchisi Mt, and certainly we know of no specimen from there. However, Benson (1940: 619) reported it as "very rare on Nchisi Mt", and in view of the occurrence of other montane forest species there, Benson (*in litt.*) agrees with us that this record is acceptable.

Subspecific distribution in Central Africa

We have not re-assessed all subspecific variation in these 2 *Bradypterus*. However, the divisions of White (1960) clearly require review in so far as he considered *B. mariae ufipae* to be synonymous with *B. cinnamomeus nyassae*. It does seem that *nyassae* is the form of *cinnamomeus* from Nguru in northeastern Tanzania southwards to Mulanje (Benson *in litt.*). As mentioned earlier, *B. mariae ufipae* appears to be longer tailed than adjacent *usambarae,* larger in body size and perhaps whiter on the throat and abdomen. However, Fig. 3 clearly shows that there is no obvious barrier between the ranges of *ufipae* and *usambarae*. The populations of northeastern Zambia (*ufipae*) approach geographically the undoubted *usambarae* of southwestern Tanzania to the north of Lake Malawi. Further investigation is needed to determine the extent of any integradation in this area.

Benson (*in litt.*) has also re-examined specimens of *B. barratti boultoni* from western Angola. He confirms that this very isolated population is rightly placed with the *barratti* group, and not with *cinnamomeus*. The 2 specimens examined have narrow rectrices and a tail/wing ratio of 1.02 and 1.03 (cf. Table 1). The heavy streaks on the chest of *boultoni* show a closer approach to the populations of southern Africa, than to those of *mariae* (*sensu stricto*) in the east.

Acknowledgements: We are greatly indebted to Mr. C. W. Benson for examining museum specimens on our behalf and for his encouraging criticism of this study. We are grateful to Mrs. R. T. Chapin, Mr. M. P. Stuart Irwin and Dr. A. Prigogine for advice; to Mr. Stuart Irwin also for the loan of specimens from the National Museums of Rhodesia, and to Mr. I. C. J. Galbraith and Dr. D. W. Snow for the use of facilities at the British Museum (Natural History), Tring. We thank Mrs. J. Hall-Craggs for advice on vocalisations, and Dr. F. Dowsett-Lemaire for preparing the sonograms at the University of Liège, Belgium, and for her comments on this paper.

References:

Belcher, C.F. 1925. Birds on the Luchenya Plateau, Mlanje, Nyasaland. *Ibis*. Ser. 12(1): 797–814.

Benson, C.W. 1940. Further notes on Nyasaland birds (with particular reference to those of the Northern Province) – Part III. *Ibis*. Ser. 14(4): 583–629.

— 1942. Additional notes on Nyasaland birds. Part 2. *Ibis*. Ser. 14(6): 299–337.

— 1946. A new race of Scrub-Warbler from Southern Rhodesia. *Ostrich* 17: 197–199.

— 1956. New or unusual records from Northern Rhodesia. *Ibis*. 98: 595–605.

— & Benson, F. M. 1977. *The Birds of Malawi*. Limbe: Montfort Press.

— ,Brooke, R. K., Dowsett, R. J. & Irwin, M. P. S. 1971. *The Birds of Zambia*. London: Collins.

Chapman, J. D. & White, F. 1970. *The Evergreen Forests of Malawi*. Oxford: Commonwealth Forestry Institute.

Dowsett, R. J. & Prigogine, A. 1974. The avifauna of the Marungu Highlands. *Exploration hydrobiologique du bassin du lac Bangweolo et du Luapula* 19: 1–67.

Grant, C. H. B. & Mackworth-Praed, C. W. 1941. A new race of Bracken Warbler from Tanganyika Territory and a new race of Moustached Warbler from Abyssinia. *Bull. Brit. Orn. Cl.* 62: 30–31.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. London: British Museum (Nat. Hist.).

Jackson, H. D. 1971. Ornithological results of the 1970 National Museums of Rhodesia expedition to Malawi. *Arnoldia (Rhod.)* 5(12): 1–10.

Keith, S. 1971. *In:* Keith, S. & Gunn, W. W. H. (producers). *Sounds of nature: Birds of the African Rain Forests*. (Text and 2 records.) Federation of Ontario Naturalists & American Museum of Nat. Hist.

Oatley, T. B. 1969. Bird ecology in the evergreen forests of north-western Zambia. *Puku* 5: 141–180.

Penry, E. H. & Talbot, J. N. 1975. Notes on the birds of the higher altitudes of Mulanje Mountain, Malawi. *Honeyguide* 82: 14–25.
Vincent, J. 1935. The birds of northern Portuguese East Africa. Part 8. *Ibis.* Ser. 13(5): 485–529.
White, C. M. N. 1960. A Check List of the Ethiopian Muscicapidae (Sylviinae). Part I. *Occ. Papers Nat. Mus. S. Rhod.* 24B: 399–430.

Addresses: R. J. Dowsett, Livingstone Museum, P.O. Box 498, Livingstone, Zambia; *Present address:* Nyika National Park, Private Bag Chilinda, P.O. Rumphi, Malawi;
R. Stjernstedt, P.O. Box RW 60, Lusaka, Zambia.

Recent additions to the Zambian List

by R. J. Dowsett

Received 13 February 1979

Benson *et al.* (1971) accepted the undoubted occurrence of 698 species in Zambia (excluding the now extinct Ostrich *Struthio camelus*). Subsequently, to the end of 1978, 18 species have been proven to occur in Zambia for the first time (and full details are awaited of at least 2 more species). In addition, confirmatory evidence has been obtained for 4 species whose occurrence was doubted, or at least not accepted unequivocally, by Benson *et al.* Most of these additional records have been documented, severally, in the *Bulletin of the Zambian Ornithological Society* (1969-78, Vols. 1-10). As this cyclostyled publication is not widely available outside Zambia, the following synthesis seems desirable. Unless stated otherwise, all specimens and copies of all photographs mentioned are held in the Livingstone Museum.

Egretta vinaceigula *Slaty Egret.* First noticed at Blue Lagoon in the early 1960s (R. A. Critchley), and subsequently at Lochinvar, where I caught and ringed 2 on 9.x.1969. At the time, *vinaceigula* was considered to be a colour phase of the Black Egret *E. ardesiaca,* and no mention was made of it by Benson *et al.* Subsequent to the reviews of its apparent specific status by Benson, Brooke & Irwin (1971) and Vernon (1971), it has been recognised at several localities in Zambia, from the Zambezi River north to the Bangweulu Swamps and Nchelenge District. Its distribution is considered in more detail by Dowsett (in press a), who shows that there are records for all months. There are specimens from Namwala District (J. F. R. Colebrook-Robjent) and Mongu District (T. O. Osborne), and several observers possess photographs from Lochinvar and Choma District.

Gyps coprotheres *Cape Vulture.* Two adults were seen and photographed at Lochinvar on 8.x.1974 (T. O. Osborne, Sir Peter Scott, *et al.*). Lady Scott's photographs have been examined by P. J. Mundy, who (*in litt.*) confirms the identification. One was seen at Lochinvar on 26.v.1977 (G. P. Robinson *et al.*), and I have confirmed the identity from photographs in Mr. Robinson's possession. Other Cape Vulture records have been claimed, but none has been documented satisfactorily. The Lochinvar birds were presumably non-breeding visitors.

Hieraaetus pennatus *Booted Eagle.* Benson *et al.* (p. 68) mention 4 sight records. Subsequently, this Palaearctic migrant has been seen on numerous occasions by competent observers. At the end of Feb. 1978 there were 69 fully acceptable records, falling between 2.x. and 28.iv., with additional sightings in August (1) and September (2). These latter, although in need of confirmation, are of interest in view of recent breeding records in South Africa, reviewed by Martin *et al.* (1978). A claimed breeding record for Zambia, of c/2 in a tree nest, on 6.iii.1936 (Cottrell 1938) is not acceptable, unless the eggs can be re-examined and proved to belong to this species. Most Zambian sightings are from the south and east, but this may be an artefact. There are still neither specimens nor photographs, but some individuals have been watched very closely, and there can be no reason for excluding the Booted Eagle from the Zambian List.